

From wd5ivd@tapr.org Fri Jun 06 02:25:29 1997
Received: from [192.168.1.2] (knezek2.coe.unt.edu [129.120.111.42]) by tapr.org
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Message-Id: <v03020933afbd6ab9f5ad@[192.168.1.2]>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"
Date: Fri, 6 Jun 1997 02:26:53 -0500
To: "TAPR-BB list mailing" <tapr-bb@tapr.org>,
 " Spread Spectrum " <ss@tapr.org>,
 "TAPR Spread Sprctrum" <ss-sta@tapr.org>,
 "NETSIG list mailing" <netsig@tapr.org>,
 "TAPR Spread Sprctrum" <ss-sta@tapr.org>
From: "Greg Jones, WD5IVD" <wd5ivd@tapr.org>
Subject: Reply Comments Docket 97-12 on SS Issues

Reply comment deadline for FCC Docket 97-12 (In the Matter of Amendment of
Amateur Service Rules to Provide For Greater Use of Spread Spectrum
Communication Technologies) was yesterday June 5th.

TAPR has started posting reply comments on our Spread Spectrum web page:
<http://www.tapr.org/ss> go to the link "Spread Spectrum Rule Changes
(RM-8737 & Doc. 97-12)"

The following reply comments are currently available for reading:

Tucson Amateur Packet Radio Corp 6/5/97
Lyle Johnson, WA7GXD 6/5/97
Glen Elmore, N6GN 6/5/97
Robert Buass, K6KGS 6/5/97
John Ackermann, AG9V 6/5/97
Steve Dimse, K4HG 6/5/97
Tom McDermott, N5EG 6/5/97
John R Bingham, W7WKR 6/5/97
John Koster, W9DDD 6/5/97

We expect to have more posted over the coming month as others send us
electronic copies and we get copies of other filings directly from the FCC.

If you filed a reply comment and would like to have it available on the web
page, please drop me an e-mail message with the text of the reply comment.

Cheers - Greg Jones, WD5IVD

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e-mail: TAPR@TAPR.ORG ftp: ftp.tapr.org web: <<http://www.tapr.org/>>

From wd5ivd@tapr.org Mon Jun 09 14:58:54 1997
Received: from [192.168.1.2] (knezek2.coe.unt.edu [129.120.111.42]) by tapr.org
(8.7.5/8.7.3/1.9) with ESMTP id 0AA28393; Mon, 9 Jun 1997 14:58:30 -0500 (CDT)
Message-Id: <v03020948afc211a8248d@[192.168.1.2]>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"
Date: Mon, 9 Jun 1997 15:03:15 -0500
To: "TAPR Spread Sprctrum" <ss-sta@tapr.org>, " Spread Spectrum "<ss@tapr.org>,
"TAPR-BB list mailing"<tapr-bb@tapr.org>
From: "Greg Jones, WD5IVD" <wd5ivd@tapr.org>
Subject: Update to Reply Comments

TAPR has started posting reply comments on our Spread Spectrum web page:
<http://www.tapr.org/ss> then go to the link "Spread Spectrum Rule Changes
(RM-8737 & Doc. 97-12)"

As of 6/9/97 the following reply comments are available on Docket 97-12

Tucson Amateur Packet Radio Corp 6/5/97
ARRL 6/5/97
Lyle Johnson, WA7GXD 6/5/97
Glenn Elmore, N6GN 6/5/97
Robert Buaas, K6KGS 6/5/97
John Ackermann, AG9V 6/5/97
Steve Dimse, K4HG 6/5/97
Tom McDermott, N5EG 6/5/97
John R Bingham, W7WKR 6/5/97
John Koster, W9DDD 6/5/97
Anthony McConnell, N3JLI and Jacob Brodsky, AB3A 6/5/97
James Barron, Jr, KA5WSS 6/5/97
Robert J. Carpenter 6/5/97
Steven K. Stroh, N8GNJ 6/5/97

Comments that we think where filed, but haven't gotten on the web page
include:

NCS
W5YI
Bill Tynan
AMSAT

and some others I am sure...

Cheers - Greg, WD5IVD

Greg Jones, WD5IVD
Austin, Texas
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<http://www.tapr.org/~wd5ivd>

From wd5ivd@tapr.org Tue Jun 10 05:13:03 1997
Received: from [192.168.1.2] (knezek2.coe.unt.edu [129.120.111.42]) by tapr.org
(8.7.5/8.7.3/1.9) with ESMTP id FAA01317 for <tapr-bb@tapr.org>; Tue, 10 Jun 1997
05:12:57 -0500 (CDT)
Message-Id: <v0302096eafc2da104118@[192.168.1.2]>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"
Date: Tue, 10 Jun 1997 05:17:33 -0500
To: "TAPR-BB list mailing" <tapr-bb@tapr.org>
From: "Greg Jones, WD5IVD" <wd5ivd@tapr.org>
Subject: Additional Reply Comments on Docket 97-12 (SS)

This is now the current list of reply comments to Docket 97-12 regarding
Amendment of the Amateur Service Rules to Provide For Greater Use of Spread
Spectrum Communication Technologies:

Tucson Amateur Packet Radio Corp 6/5/97
ARRL 6/5/97
Lyle Johnson, WA7GXD 6/5/97
Glenn Elmore, N6GN 6/5/97
Robert Buaas, K6KGS 6/5/97
John Ackermann, AG9V 6/5/97
Steve Dimse, K4HG 6/5/97
Tom McDermott, N5EG 6/5/97
John R Bingham, W7WKR 6/5/97
John Koster, W9DDD 6/5/97
Anthony McConnell, N3JLI and Jacob Brodsky, AB3A 6/5/97
James Barron, Jr, KA5WSS 6/5/97
Robert J. Carpenter 6/5/97
Steven K. Stroh, N8GNJ 6/5/97
THE W5YI GROUP 6/5/97
AMSAT 6/5/97
Central States VHF Society 6/5/97
Bill Tynan, W3XO 6/5/97

<http://www.tapr.org/ss> use the link regarding rule making.

There are maybe just a few additional comments to complete the record.
Thanks to all those that have sent electronic copies of their filings. I
believe it helps everyone to see what positions are being taken and
discussed regarding this important rule making process.

Cheers - Greg, WD5IVD

Greg Jones, WD5IVD
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From wd5ivd@tapr.org Mon Jun 16 13:24:49 1997
Received: from [208.134.134.40] ([208.134.134.40]) by tapr.org (8.7.5/8.7.3/1.9)
with ESMTP id NAA25666 for <tapr-bb@tapr.org>; Mon, 16 Jun 1997 13:24:48 -0500
(CDT)
Message-Id: <v03020935afcb31314f32@[208.134.134.40]>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"
Date: Mon, 16 Jun 1997 13:17:35 -0500
To: "TAPR-BB list mailing" <tapr-bb@tapr.org>
From: "Greg Jones, WD5IVD" <wd5ivd@tapr.org>
Subject: 1997 DCC Call for Papers (Reminder)

Call for Papers

1997 ARRL and TAPR Digital Communications Conference
October 10-12, 1997
Baltimore, Maryland (minutes from BWI airport)

Web: <http://www.tapr.org/dcc>

It's that time again! Time to mark your calendar and think about what to publish for the upcoming 16th Annual ARRL and TAPR Digital Communications Conference.

The 1997 ARRL and TAPR Digital Communications Conference will be held October 10-12, 1997 in Baltimore, Maryland. This year's conference location is just minutes away from the BWI (Baltimore/Washington International) Airport.

For full details on the conference see <http://www.tapr.org/dcc> or contact the TAPR office for the DCC information flyer.

Call for Conference Proceeding Papers

Anyone interested in digital communications is invited to submit a paper for publication in the Conference Proceedings. Presentation at the Conference is not required for publication. If you know of someone who is doing great things with digital communications, be sure to personally tell them about this! Papers are due by August 20th, 1997, and should be submitted to Maty Weinberg, ARRL, 225 Main Street, Newington, CT 06111 or via the Internet to lweinberg@arrl.org. Information on paper submission guidelines are available on-line (<http://www.tapr.org/dcc>) or can be mailed.

Contact TAPR to register or for more information on the DCC.

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From wd5ivd@tapr.org Sun Jun 22 15:19:35 1997
Received: from [208.134.134.40] ([208.134.134.40]) by [tapr.org](http://www.tapr.org) (8.7.5/8.7.3/1.9)
with ESMTP id PAA19988; Sun, 22 Jun 1997 15:19:30 -0500 (CDT)
Message-Id: <v03020914afd337305d9f@[208.134.134.40]>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"
Date: Sun, 22 Jun 1997 15:22:21 -0500
To: "TAPR-BB list mailing" <tapr-bb@tapr.org>
From: "Greg Jones, WD5IVD" <wd5ivd@tapr.org>
Subject: Motorola Oncore VP Interface Board kit

Motorola Oncore VP Interface Board kit

TAPR is proud to offer a Motorola Oncore VP Interface Board kit, designed by Doug McKinney, KC3RL. It is a compact 5 volt power supply and RS-232 interface board for the Oncore VP Global Positioning System (GPS) receiver. All parts are included - including screws and stand-offs. It is the same size as a Motorola Oncore VP 2" x 3.25" x 0.95" (with stand-offs). RS-232 interface for input and output control. DGPS input (select RS-232 interface between computer or DGPS control). High-efficiency LM2574 step-down regulator provides 5 VDC from 7-30 VDC input.

The price is:

\$31.50 US for members of TAPR
or
\$35.00 US for non-members

+ \$5.00 shipping/handling

For information on the VP Interface Board kit:

<http://www.tapr.org/gps/vpib.html>

For information on the TAPR Motorola Oncore VP Group Purchase:

<http://www.tapr.org/gps/oncore.html>

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e-mail: tapr@tapr.org ftp: [ftp.tapr.org](ftp://ftp.tapr.org) web: <http://www.tapr.org/>

From wd5ivd@tapr.org Tue Jun 24 18:08:31 1997
Received: from [208.134.134.40] ([208.134.134.40]) by [tapr.org](http://www.tapr.org) (8.7.5/8.7.3/1.9)
with ESMTP id SAA02225 for <tapr-bb@tapr.org>; Tue, 24 Jun 1997 18:08:21 -0500
(CDT)
Message-Id: <[v03020920afd6022a83e4@\[208.134.134.40\]](mailto:v03020920afd6022a83e4@[208.134.134.40])>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"
Date: Tue, 24 Jun 1997 18:05:17 -0500
To: "TAPR-BB list mailing" <tapr-bb@tapr.org>
From: "Greg Jones, WD5IVD" <wd5ivd@tapr.org>
Subject: TAPR TAC-2 (Totally Accurate Clock)

TAPR TAC-2 (Totally Accurate Clock)
<http://www.tapr.org/tapr/html/tac2.html>

It is with considerable pleasure that TAPR can announce that version 2 of "Totally Accurate Clock" (TAC-2) is now available in kit form. TAPR has been working with Tom Clark, W3IWI, to make an improved version of the TAC available to all. TAC-2 Rev.C of the kit is now available from TAPR.

The "Totally Accurate Clock" TAC-2 kit is intended to serve several purposes:

- * It provides a "universal" electrical and mechanical interface for a number of common OEM board-level GPS receivers including specifically:
 - o Garmin GPS-20
 - o Motorola Oncore
 - o Trimble SK8
- * It provides interfaces for the 1 pulse-per-second (1PPS) signal generated by these receivers:
 - o Low-impedance, fast rise-time 1PPS signals for "laboratory" applications.
 - o RS232 level 1PPS signals for computer applications.
 - o Specialized 1PPS interfaces for an add-on PCB that will stabilize a low-cost crystal oscillator to an accuracy ~ 1 part-per-billion
- * It provides several different power supply options to make use of your GPS receiver easier. The power interface is similar to (and compatible with) those used for computer disk drives:
 - o A low-cost, (7805-type) regulator.
 - o A high-efficiency switching power supply.
 - o Direct 5 volt power.
- * It has provision for an Uninterruptable Power Supply (UPS) to buffer

the GPS receiver through brief power outages.

- * It provides Battery Backup so the GPS receiver can wake up "smart."
- * It can provide isolated power for an amplified GPS antenna.

Since the TAC-2 has so much flexibility, there are several options you will have to choose from during construction. The "base" implementation will satisfy the needs of many radio amateurs with support for the Garmin GPS-20 and Motorola ONCORE Basic receivers. A few jumper changes enable support for the Motorola ONCORE VP/UT receiver. Some added parts and some more jumper changes are needed if you plan to use a Trimble SK-8.

The TAC-2 is offered as a kit which will take approximately 2 or 3 hours to build.

The TAC-2 kit has been designed to be very easy to assemble. TAPR supplies detailed "Heathkit-like" instructions that only require you to know which end of the soldering iron is hot and a little knowledge on how to put things together!

One of the major interests that TAPR has in GPS timing is in the use of GPS as a way to steer ("discipline") an oscillator. By tying together a low-cost crystal oscillator and a GPS receiver, it is possible to have a Rubidium-class (better than one part per billion) frequency standard. The TAC-2 has been designed to support this function and the TAC-2 project team is working on developing the "TOC" (TAC Oscillator Controller). The plan is that the TOC will plug directly into the TAC-2 circuit board. More information on this project will be made available as progress is made. No time is set for delivery of this daughterboard at this time.

General Information

The price is:

\$125.00 US for members of TAPR

or

\$139.00 US for non-members

plus shipping and handling (see below).

and will include:

- * TAC-2 Rev C PCB Board
- * All necessary parts for the TAC-2 to allow interface to either the Oncore VP or Garmin GPS-20
- * Documentation

Please note: This is not an enclosed unit. Enclosures are being worked on, but will not be available until the fall.

If you would like to order one of these units, you can

e-mail tapr@tapr.org,
phone (940) 383-0000,
fax (940) 566-2544.

or use the on-line TAPR Order form.

Office Hours: Tuesday - Friday 9am - 12pm, 3pm - 5pm Central Time

Questions concerning the unit and details on the buy will be handled on the TAPR GPS Special Interest Group list.

Shipping and Handling

- * Shipping and Handling within the US will be \$5.00 US by UPS Ground unless otherwise requested by purchaser.
- * International Shipping will need to contact the TAPR office and get a quote on the shipping to your country. TAPR uses International Express Mail, unless the purchaser requires something else.

What changes were made between the version 1 and version 2 designs

- * The circuitry has been improved in a number of areas:
 - o better low-Z 1PPS buffers.
 - o better RS232 drivers.
 - o full "Plug 'n Play" support for any of the Motorola ONCORE receivers (the original PVT-6/BASIC, the 8-channel VP or the new UT-series) and several other receivers as well.
- * A number of power supply options have been provided, including
 - o the TAC-2 can look like a "disk drive" when mounted in a PC
 - o an optional high-efficiency switching power supply
 - o an UPS (uninterruptable power supply) capability (good for a few minutes)
 - o an optional regulator for external antenna bias
 - o several BBRAM "keep alive" power options, etc.
- * The off-board connections for the original TAC were all soldered wires. On the TAC-2, we made extensive use of IDC ("crimp-on") connectors for ease of assembly and reliability.
- * The ONLY significant deletions from the original TAC are:
 - o the on-board MMIC L-band RF amplifier.
 - o The original GSFC-supplied TACs were in a metal box (we used off-the-shelf RS232 "A/B" switch boxes). The TAPR TAC-2 is a kit-form circuit board. You have to provide your own mechanical mounting (for the time being).
 - o An A/B switch box would work fine as a mounting. Another

possibility is that the TAC-2 circuit boards are about the size of a small computer disk drive and the power connection is the same as on a disk drive. TAPR is planning a mounting that would put the TAC-2 in a disk drive bay inside your PC.

Totally Accurate Clock (TAC)

Excerpts from TOTALLY ACCURATE CLOCK ANNOUNCEMENT, Tom Clark, NASA/GSFC
(February 2, 1995)

The "TAC" name is supposed to invoke a smile on your face. Many of you remember Heathkit's "Most Accurate Clock" (a WWV receiver) and I see advertisements for VLF clocks (WWVB in USA, DCF77 in Europe) that still use the "Most Accurate Clock" name in their advertising. Since the "TAC" is 3-4 orders of magnitude better than the "Most Accurate Clock" units, the "Totally" name seems warranted (also, TAC are my initials and this was begun as a home project!).

The TAC project began when I was on sabbatical at Onsala when Bernt Ronnang got me an early prototype of a Motorola PVT-6 OEM GPS receiver. In that incarnation, the PVT-6 was pretty disappointing. When I got back home, I had Motorola update the internal firmware and found that its personality had changed completely -- it was now very precise, but it had about a 500 nsec bias. I contacted a friend at Motorola who was involved in the PVT-6 software and he told me that tests at USNO had uncovered the same error. I was added to the "beta" group, got my initial prototype updated with the latest firmware and began more detailed testing. What I then found was that the PVT-6 receiver had the best timing performance I have seen in any small GPS receiver. With a small amount of care in setting it up, it now gives 50 nsec or better RMS timing precision and biases appear to be < 20 nsec.

The TAC project now involves both hardware and software. Let me briefly describe both to you.

HARDWARE:

The core of the TAC consists of a GPS. Several are going to be supported in the TAC-2 design (Motorola ONCORE, Garmin GPS-20, Trimble SK-8) The circuit board allows these various GPS to be mounted to the board.

The TAC-2 adds a number of desirable features:

- * The 1 PPS output signals are buffered through a 74AC04 gate to improve the drive capabilities and to act as a "fuse" to prevent damage to the receiver in case of an operator goof. Up to three independent buffered outputs are provided, and the buffers will drive about +2 to +2.5 volts into a 50 ohm termination. The normal logic polarity is positive going at the epoch time, but this can be inverted if desired by some simple jumpers.

- * Up to three open collector 1PPS signals are also available, negative going. Normally these would be used to drive display LEDs, but they can be used for other purposes.
- * The add-on board includes an RS232 driver that provides 1 PPS time synchronization to an attached computer. The 1 PPS signal is normally connected to the computer's DCD input.
- * The RS232 I/O to the computer is buffered and isolated from the receiver to act as a "fuse" to prevent damage to the expensive receiver in case of an operator goof. An RS232 OR-gate is supplied for the receiver input signal to allow RTCM SC104 Differential GPS signals to be fed to the GPS receiver.

SOFTWARE:

A program called SHOWTIME displays the current time in BIG DIGITS you can see from across the room. In addition to just showing the UTC time, it includes a display of the date, day-of-week, day-of-year, local and Greenwich Mean Sidereal times, JD and MJD, and even the current GPS week. You can enable audible "WWV-like" time ticks to assist you in setting the formatter (or your wrist-watch). You can have the software automatically reset the PC's internal clock with about 25 msec accuracy. All the time display updates and audible ticks happen synchronously with the GPS 1 PPS signal because the PC reads the tick on its DCD line.

SHOWTIME allows you enter timing offsets and handles all the arithmetic for you. It allows you to make easy corrections for time delays in cables and the instrument and it tells you (with 1 nsec resolution) the actual epoch of the 1PPS tick and it gives you an estimate of the accuracy of the tick. SHOWTIME gives you a nice display of which satellites you using and which satellites are above the horizon. This includes a bar-graph "S- meter" for each of the GPS satellites currently in lock which are updated once per second.

The software lets you change operating modes (timing vs. position, elevation masks, satellite selection criteria, etc) easily and when you are running in position-determination mode, it will handle all the position averaging tasks for you. At any time, you can save the current configuration (positions, timing offsets, receiver modes, etc) to a disk file and restore that configuration at a later time.

At this time SHOWTIME runs stand-alone on a separate MS-DOS PC (but it does seem to run OK in the DesqView multitasker). Once you have set parameters into the GPS receiver, the PC operations can be terminated.

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